



1746  
PATENT  
Attorney Docket No. 54008.8012.US01  
P96-0015US2

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

IN RE APPLICATION OF: Eric J. BERGMAN  
APPLICATION NO.: 09/811,925 ✓  
FILED: MARCH 19, 2001 ✓  
FOR: **METHODS FOR CLEANING SEMICONDUCTOR  
SURFACES**

EXAMINER: Z. El Arini  
ART UNIT: 1746

#21  
10/7/03  
RECEIVED  
SEP 16 2003  
TC 1702

STATEMENT OF RELATED APPLICATIONS

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

Applicant calls the Examiner's attention to the following applications claiming similar subject matter:

1. Serial No. 09/536,251; Examiner Frankie L. Stinson; Art Unit 1746. The most recent Office Action and pending claims from Serial No. 09/536,251 are attached.
2. Serial No. 09/837,722, now U.S. Patent No. 6,601,594.

Respectfully submitted,  
Perkins Coie LLP

Date: Sept. 10, 2003

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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/536,251	03/27/2000	Eric J. Bergman	P98-0029US2	3578

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EXAMINER

STINSON, FRANKIE L

ART UNIT PAPER NUMBER

1746

DATE MAILED: 07/22/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Advisory Action

p98-0029US2

54008.8055.4505



UNITED STATES DEPARTMENT OF COMMERCE

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APPLICATION NO./ CONTROL NO.	FILING DATE	FIRST NAMED INVENTOR / PATENT IN REEXAMINATION	ATTORNEY DOCKET NO.
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EXAMINER
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ART UNIT	PAPER
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22

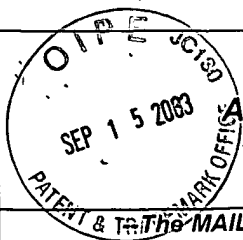
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SEP 16 2003  
TC 1700

FRANKIE L. STINSON  
Primary Examiner  
Art Unit: 1746



# Advisory Action

Applicati n No.

09/536,251

Applicant(s)

BERGMAN ET AL.

Examin r

FRANKIE L. STINSON

Art Unit

1746

The MAILING DATE of this communication app ars on the cover sh t with the correspondence address --

## THE REPLY FILED

FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

Therefore, further action by the applicant is required to avoid abandonment of this application. A proper reply to a final rejection under 37 CFR 1.113 may only be either: (1) a timely filed amendment which places the application in condition for allowance; (2) a timely filed Notice of Appeal (with appeal fee); or (3) a timely filed Request for Continued Examination (RCE) in compliance with 37 CFR 1.114.

### PERIOD FOR REPLY [check either a) or b)]

- a) ☐ The period for reply expires: \_\_\_\_\_ months from the mailing date of the final rejection.
- b) ☒ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection. ONLY CHECK THIS BOX WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

1. ☐ A Notice of Appeal was filed on \_\_\_\_\_. Appellant's Brief must be filed within the period set forth in 37 CFR 1.192(a), or any extension thereof (37 CFR 1.191(d)), to avoid dismissal of the appeal.
2. ☐ The proposed amendment(s) will not be entered because:
- (a) ☐ they raise new issues that would require further consideration and/or search (see NOTE below);
  - (b) ☐ they raise the issue of new matter (see Note below);
  - (c) ☐ they are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
  - (d) ☐ they present additional claims without canceling a corresponding number of finally rejected claims.

NOTE: \_\_\_\_\_

3. ☐ Applicant's reply has overcome the following rejection(s): \_\_\_\_\_.
4. ☐ Newly proposed or amended claim(s) \_\_\_\_\_ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).
5. ☐ The a) ☐ affidavit, b) ☐ exhibit, or c) ☐ request for reconsideration has been considered but does NOT place the application in condition for allowance because: \_\_\_\_\_.
6. ☐ The affidavit or exhibit will NOT be considered because it is not directed SOLELY to issues which were newly raised by the Examiner in the final rejection.
7. ☒ For purposes of Appeal, the proposed amendment(s) a) ☐ will not be entered or b) ☒ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.

The status of the claim(s) is (or will be) as follows:

Claim(s) allowed: 37.

Claim(s) objected to: NONE.

Claim(s) rejected: 1, 5, 10-15, 17-22, 31, 32 AND 34.

Claim(s) withdrawn from consideration: \_\_\_\_\_.

8. ☐ The proposed drawing correction filed on \_\_\_\_\_ is a) ☐ approved or b) ☐ disapproved by the Examiner.
9. ☐ Note the attached Information Disclosure Statement(s) (PTO-1449) Paper No(s). \_\_\_\_\_.
10. ☐ Other: \_\_\_\_\_

FRANKIE L. STINSON  
Primary Examiner  
Art Unit: 1746

Art Unit: 1746

1. The Final Rejection of May 5, 2003 is maintained. In further regard to Applicant's amendment filed July 14, 2003, applicant argues that claims 1, 31, 32 require two critical distinctions, one being that the liquid is heated and the other being that the gas moves, via diffusion, in prescribed direction. It is the examiner position there never is actually claimed "diffusion" in any of claims 1, 31 and 32 and "diffusion" has been defined by the examiner as in paragraph 8 of paper 18, which is it's broadest reasonable interpretation (see MPEP 2111). Also the claims merely call for "moving ozone through a boundary layer to the surface of the workpiece"... a prescribed direction, as argued, is not claimed. As for the "random movement", assuming that the same is indeed inherent in the applied prior art, it still meets the limitation of "moving ozone through the boundary layer to the surface of the workpiece" since the ozone attacks the contaminants on the surface of the workpiece and therefore must move through the boundary layer to the surface of the workpiece where the contaminants are located. As for the heated liquid, note that Nakajima and Japan 4-125927 both teach the heated liquid in combination with ozone treatment.

2. Any inquiry concerning this communication or earlier communications from the examiner should be directed to FRANKIE L. STINSON whose telephone number is (703) 308-0661. The examiner can normally be reached during the first week of the pay-period M-F from 5:30 a.m. to 3:00 p.m. and during the second week of the pay-period from Tu-Th second from 5:30 a.m. to 3:00 p.m. and on Fri. from 5:30 a.m. to 2:00 p.m. Alternating Mondays off.

\*Art Unit: 1746

The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9310 (NON-FINAL REJECTION STATUS) and (703) 872-9311 (AFTER-FINAL REJECTION STATUS).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Any inquiry for missing parts of this Office Action (copies of references, pages, forms etc.), contact Office Manager Ms. Sandra Sewell (703) 308-0661.

fls

FRANKIE L. STINSON  
Primary Examiner  
Art Unit 1746

**COMPLETE SET OF PENDING CLAIMS**

1. (Previously Amended) A method for treating a workpiece comprising the steps of:

heating a liquid;

applying the heated liquid onto a surface of the workpiece;

forming the heated liquid into a boundary layer on the surface; and

moving ozone through the boundary layer to the surface of the workpiece.

2-4. (Withdrawn)

5. (Currently Amended) The method of claim 1 further comprising the steps of: exposing the surface to electromagnetic radiation.

6. (Withdrawn)

7-9. (Cancelled)

10. (Original) The method of claim 1 wherein the liquid comprises de-ionized water and a member selected from the group consisting of: hydrochloric acid; sulfuric acid; and ammonium hydroxide.

11. (Original) The method of claim 1 further including the step of controlling the thickness of the boundary layer by rotating the workpiece.

12. (Original) The method of claim 1 further including the step of controlling the thickness of the boundary layer by adding a surfactant to the liquid.

13. (Currently Amended) The method of claim 1 wherein the step of forming the boundary layer comprises the step of spraying the liquid onto the surface of the workpiece at a controlled rate.

14. (Original) The method of claim 1 wherein the ozone is introduced as a gas into the environment around the liquid boundary layer and diffuses into and through the liquid boundary layer, to react with a surface of the workpiece.

15. (Previously Amended) The method of claim 1 wherein at least some of the ozone is injected or mixed into the liquid and dissolves into the liquid, before the liquid is applied onto the surface of the workpiece.

16. (Cancelled)

17. (Original) The method of claim 1 further comprising the step of treating the workpiece in a process chamber having a pressurized atmosphere.

18. (Original) The method of claim 17 further comprising the step of supplying steam under pressure into the process chamber.



19. (Original) The method of claim 17 further comprising the step of injecting ozone in a gas form, into the chamber.

20. (Original) The method of claim 1 further comprising the step of irradiating the workpiece with UV light, to enhance reaction kinetics.

21. (Original) The method of claim 1 further comprising the steps of rinsing and drying the workpiece.

22. (Original) The method of claim 1 wherein the liquid comprises superheated de-ionized water.

23-30. (Withdrawn)

31. (Currently Amended) A method for treating a workpiece comprising the steps of:

heating a liquid;

applying the liquid onto a surface of the workpiece, with the liquid comprising de-ionized water, and at least one of hydrochloric acid and hydrofluoric acid;

forming the liquid into a boundary layer on the surface; and

moving ozone through the boundary layer to provide the surface of the workpiece where the ozone reacts with the surface of the workpiece.

32. (Previously Added) A method for treating a workpiece comprising the steps of:

heating a liquid;  
applying the heated liquid to a surface of the workpiece, with the liquid comprising de-ionized water and a surfactant;  
forming the liquid into a boundary layer on the surface; and  
moving ozone through the boundary layer to the surface of the workpiece to react with the surface of the workpiece.

33. (Withdrawn)

34. (Previously Added) The method of claim 1 wherein the ozone is provided separately from the heated liquid.

35-36. (Withdrawn)

37. (Previously Added) A method for treating a workpiece comprising the steps of:

heating a liquid;  
spraying droplets of the heated liquid onto a surface of the workpiece at a controlled rate;  
controlling the size of the droplets sprayed onto the surface of the workpiece;

forming the heated liquid into a boundary layer on the surface of the workpiece;  
and  
diffusing ozone through the boundary layer, to cause a reaction at the surface of  
the workpiece.